Consideration of Water Impacts from Planned Woodlot Harvesting near Nakusp

Complaint Investigation 040534

FPB/IRC/98

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The Investigation

On March 12, 2004, the Granite Ridge Water Users Committee (the complainant) asked the Board to investigate the approval of a forest development plan (FDP) for a woodlot located near Edgewood in the Arrow Boundary Forest District. The complainant believes that approval of the FDP did not adequately consider water resources. The complainant makes the following assertions: a community watershed assessment was not completed; the Community *Watershed Planning Guidebook* was not followed; and the district manager's approval of the plan did not adequately consider a hydrogeologist's report (provided by the complainant) or hydrologic values. The complainant expects that logging and road building will affect the domestic water supply and wants the woodlot relocated to a less sensitive area.

The Board investigated whether the FDP had to meet the Forest Practices Code requirements for community watersheds and whether the district manager's approval of the FDP was appropriate considering the concern about domestic water.

Background

When the *Forest Practices Code of British Columbia Act* and regulations (the Code) came into force in June 1995, watersheds could be designated as 'community watersheds' if special care was needed to minimize the effects of forest practices on domestic water supplies. To qualify, a watershed had to have an intake on a stream or occupy a watershed area less than 500 square kilometres; and either be licensed for a waterworks purpose (defined in the *Water Act*) or for a domestic purpose by a 'water-users community' incorporated under the *Water Act*. Under Section 41(8) of the Code Act, about 475 watersheds were grandparented as community watersheds. While the Code provided some general protection for water quality, it had additional provisions to protect watersheds that supplied water for domestic purposes if they were designated as 'community watersheds'. For more information on domestic water use and forest harvesting, see the Board's October 2001 report entitled *Domestic Water-User Input in Forest Development Planning in the Nelson Forest Region.*

Woodlot 401 is on Granite Ridge, also known as Fire Ridge, between Arrow Lake and Inonoaklin Creek. The woodlot licence was issued in 1985, and the woodlot has been actively managed and harvested since. The 300-hectare woodlot is bordered by about 70 homes down slope on private lands. The private landowners collect water for domestic purposes from either shallow collection basins fed by natural springs or from shallow wells down to the water table. The exact source of the springs and groundwater is not known, but it is expected to be located throughout Granite Ridge.

The FDP for Woodlot 401 was advertised for public review and comment on March 27, 2003. The plan proposed 19.7 hectares of partial-cut harvesting; 5.4 hectares of clearcut harvesting;

and 1.3 kilometres of new road construction. There was substantial concern raised by the water users about the proposed plan. Through the spring and summer of 2003, the water users, licensee and Ministry of Forests (MOF) staff attended several joint meetings and field reviews to understand and address the concerns.

During the fall of 2003, both a MOF forest hydrologist and a hydrogeologist[1] consulted by the complainant independently prepared reports on the woodlot. The complainant's hydrogeologist report was prepared by one of its members with a doctorate in Earth Sciences and experience in hydrogeology, water quality and environmental assessment in eastern Canada. The MOF forest hydrologist report was dated October 2003. The complainant submitted its hydrogeologist letter/technical report on October 7, 2003, and a critique of the MOF report on December 16, 2003. On December 23, 2003, the district manager approved the FDP complete with a rationale for his decision.

Issues

The Board examined the following questions:

1. Did the FDP have to meet the Code requirements for community watersheds and follow the requirements of the *Community Watershed Guidebook* and, if so, did it do so?
2. Did the district manager adequately consider domestic water issues in his approval of the FDP?

Discussion

The *Forest Practices Code of British Columbia Act* (Code Act) and regulations applied to forest development planning and approvals until January 31, 2004, so this report considers the requirements of the Code for the period under investigation which was prior to the implementation of the new *Forest and Range Practices Act*.

1.0 Did the FDP Have to Meet the Code Requirements for Community Watersheds?

The complainant asserts that a required watershed assessment was not completed and the *Community Watershed Planning Guidebook* was not followed.

Under the Code Act, woodlot management and practices were governed by the Woodlot Licence Forest Management Regulation (WLFMR). Under section 11(8)(a)(ii) of the

[1] Forest hydrologists specialize in analysing how watersheds behave and respond to forest operations. Hydrologists provide information to other resource professionals to: aid in planning or evaluating the impact of forest operations; how to restore natural resources that have been damaged; and make recommendations to safeguard watersheds. A hydrogeologist studies the way groundwater moves through soil and rock. Hydrogeologists often specialize in the cleanup of spills and contamination sites as well as investigate the source of water contaminants.

WLFMR, the woodlot licensee was required to specify measures in its development plan to protect water quality if harvesting might impact water quality at a licensed domestic water supply intake. There are five licensed water intakes located below proposed harvesting and road construction under the FDP. The closest intakes are approximately 250 metres from any development. The woodlot licensee specified harvesting and road construction measures to protect water quality in its FDP. The licensee met the requirement of section 11 by further considering and adopting recommendations of the MOF hydrologist into its development plan. The adequacy of the proposed measures was considered by the district manager in his decision to approve the plan as discussed later in this report.

Section 14 of the former Operational and Site Planning Regulation (OSPR) required the completion of watershed assessments, but only for watersheds designated as a 'community watershed'. However, section 14 of the OSPR does not apply to woodlot licensees because section 3(2) of the WLFMR exempts woodlots from the OSPR. The WLFMR does not require a woodlot licensee to conduct a watershed assessment. Nevertheless, section 10 of the WLFMR requires a woodlot's FDP to be consistent with any existing watershed assessment if a district manager decides that the assessment is applicable to the woodlot area. No such decision was made in this case.

The area encompassing Granite Ridge, including the area of Woodlot 401, is not a designated community watershed as defined by the Code Act, nor was any existing watershed assessment completed for the area. Consequently, the licensee did not have to follow the Code requirements for such watersheds. Thus, the licensee was not required to conduct a watershed assessment, modify its FDP to be consistent with any existing watershed assessment, nor follow the Community Watershed Guidebook.

The FDP met content requirements of the Code dealing with community watersheds and licensed water intakes as provided by the former Woodlot Licence Forest Management Regulation. Thus, the FDP complied with Code requirements.

2.0 Did the District Manager Adequately Consider Domestic Water Issues in his Approval of the FDP?

The complainant maintained that the district manager's approval of the FDP did not adequately consider the complainant's hydrogeologist report or water resource values.

Section 41(1)(b) of the Act required that a district manager be satisfied that a FDP adequately managed and conserved forest resources of the area to which it applied. That involved discretion. The Board reviews discretionary decisions to determine if they are within a range of reasonableness, not whether they are the best or most optimal decision.

The Board examined whether the district manager considered water resource values in his decision to approve the FDP and if it was reasonable to expect that the plan would adequately manage and conserve water resource values.

2.1 Did The District Manager Consider Both Reports and Did He Consider Water Resource Values in his Decision to Approve the FDP?

The Complainant's Hydrogeologist Report

The complainant was concerned about how logging would affect the hydrology of the ridge; specifically, how logging would affect the domestic water supply.

The complainant offered a report discussing the hydrogeology of the area. It presumed that wetlands on the ridge, plus infiltration of rainwater, formed the sources for the wells and springs.

The complainant also criticized the MOF hydrologist report, reiterating concerns about the potential risk to the water supply of all the users. The complainant asserted that even small changes brought about by harvesting could have dramatic effects, given the small catchment area. As well, the complainant was concerned that the logging would reduce the shading of the wetlands and wet areas. With the loss of shading, more water would be lost through evaporation and an increase of water use by the remaining plants. The MOF hydrologist recommended reserves for the wetlands but the complainant asserted that the proposed reserves and riparian management areas were inadequate, referring to published articles on the functioning of riparian areas. Lastly, the complainant maintained that road construction could accelerate the drainage in the catchment area, reducing its ability to store groundwater. The complainant's report concluded that the FDP approval would result in a high risk to water quality and quantity. It recommended that no harvesting take place because of uncertainty as to whether the anticipated damage could be mitigated.

The MOF Forest Hydrologist Report

The MOF forest hydrologist stated that the areas on the top of the ridge were important recharge areas for groundwater, but that there was no direct connection between the wet swampy areas on the ridge and the down-slope springs and wells. The report maintained that it was impossible to identify the route, or predict the length of time the water takes to move down slope to the springs and wells.

Contrary to the complainant's report, the MOF hydrologist report presumed that the harvest of mature trees would increase the amount of water available, because living trees use water. The report concluded that the largest threat to the down-slope water users would come from either soil compaction from road and skid trail construction or from diversion of water from the wet areas. To reduce the risk of that happening, the MOF hydrologist made several recommendations.

First, any water movement through bedrock fractures was susceptible to alteration by rock blasting during road construction. As a result, the report recommended that the there be no

blasting. If blasting was deemed necessary during the development of site-specific plans, then either the road should be moved, or the licensee should have an engineer and hydrologist further study the site to mitigate blasting impacts.

Second, roads and trails might intercept subsurface flows. The report recommended that culverts be used wherever water was expected to collect; that the minimum standards for culverts be exceeded; and that the culverts be removed after harvesting wherever there were distinct water channels.

Third, wet areas and depressions are liable to be compacted during harvesting thus reducing storage capacity and increasing the amount of overland water flow. The MOF forest hydrologist recommended harvesting in wet areas only on snow or on frozen soils. The report also recommended that the wet areas be avoided by marking the location of the skid trails and by ribboning the location of the wet areas prior to snowfall. Lastly, several wet areas were not identified on the FDP map. The report recommended that those wet areas be identified in the field and protected during harvesting.

The report concluded that the proposed operations posed a low risk to water quality and a low-to-medium risk to water quantity; and that proposed measures to reduce risk would protect the water resource from impacts due to road construction and harvesting.
The MOF hydrologist also responded to the issues raised in the complainant's report. He noted that removing trees from the site would reduce the amount of water lost from the soil. The amount of water used by trees would be reduced, as there would be fewer trees on site. Consequently, there would be an increase in available water.

The MOF hydrologist generally agreed with the observations in the complainant's report but disagreed with the evaluation of risk. During the investigation, the MOF hydrologist stated that he has been dealing with harvesting and spring areas for years, and was familiar with the concepts and references cited by the complainant. He concluded that there would be enough vegetation left after harvesting to act as a solar filter, shading the ponds. Referring to the effectiveness of the wetland reserves, he stated that the wetter areas would only be harvested on snow pack, to prevent compaction and disturbance from harvesting equipment. He noted that the main difference between his report and the complainant's was the estimation of risk to the downstream water users.

Did the District Manager Consider Both Reports and Did He Consider Water Resource Values in his Decision to Approve the FDP?

Before approving the FDP, the district manager was concerned with the issues raised during public review and comment. He instructed staff to consult with the MOF forest hydrologist and to further involve the local water users. This resulted in increased attention on the water users' issues. This involvement resulted in two meetings, an on-site discussion, mapping of the water users' water intakes and ultimately a report with recommendations of the MOF hydrologist. The licensee incorporated all of the recommendations from the MOF

forest hydrologist into its final FDP proposal. On December 23, 2003, staff told the district manager how the outstanding issues with the FDP had been addressed.

In the written rationale for the FDP approval, the district manager acknowledged the water users' concerns. The district manager noted that the assessment of the area by the MOF hydrologist had addressed the water issues. The district manager accepted and agreed with the MOF forest hydrologist's risk assessment and noted that the licensee's FDP included a commitment to follow the recommendations of that report.

The rationale acknowledged that the complainant's report disputed the MOF report. However the district manager found that the complainant's report provided no additional information indicating that the MOF hydrologist's recommendations would not manage and conserve the water resource. The district manager explained his decision to the Board, stating that he considered the issues around wetland storage areas, subsurface flows, road construction and rock blasting. He said that he looked at risk and the proposed mitigation of that risk for each of these issues. He noted that the amount of proposed harvesting and road building was comparatively modest and that it recognized the storage capacity and significance of the wetlands on the ridge.

The district manager also stated that the district has a long history of successful forest management in sensitive watersheds. Past experience gave him a high level of confidence in the MOF hydrologist and the proposed FDP. The district manager concluded that the proposed harvesting and road construction did not pose a high risk of water interruption. Lastly, the district manager said that MOF was committed to adjusting the site plans based on further fieldwork and future on-site discussions with the complainant.

The Board is satisfied the district manager reviewed both professional reports and considered the potential impacts of forest development on the water resource. The district manager made particular note that there were allowances for water values in the plan; the significance of area's wetlands had been considered; and the recommendations of the MOF forest hydrologist had been adopted by the licensee.

While the complainant opposed the district manager's decision to approve the plan, the district manager did consider the available information, including the risks to the water resource and the mitigation of those risks. The Board finds the decision to approve the plan was reasonable.

2.2 Was it Reasonable to Expect that the Plan Would Adequately Manage and Conserve Water Resource Values?

The complainant believed that the risk to the subsurface water supply hadn't been given adequate consideration in the approval of the FDP. The complainant asserted that the *Community Watershed Planning Guidebook* was not followed. The water users feel that they were forced to take a leap of faith that the harvesting would not disturb their water

supplies. In the event that water supplies are disturbed, the ability of the Ministry of Forests or the licensee to remedy any problems is doubtful. In short, the water users view the risk to their water supply as unacceptable.

The Board examined whether it was reasonable to expect that the FDP would adequately manage and conserve water resource values.

Wetlands

The complainant's report questioned the size and adequacy of the riparian management area on the wetlands.

The Code defines five classes of wetlands (W1 to W5) based on size, biogeoclimatic unit, and whether the wetland is simple or complex. The Code then assigns a width for reserves or riparian management areas. Within the riparian management area, constraints to forest practices are applied for protection of non-timber resource values. Best management practices for riparian management areas are recommended in the 1995 *Riparian Management Area Guidebook*.

The FDP describes two W3 class wetlands located adjacent to two of the four cutblocks in the plan. The Code requires a 30 metre riparian management zone on W3 wetlands. The licensee established a seven meter no-harvest zone between the two wetlands and incorporated them into a large wildlife tree patch. That wildlife tree patch is protected from harvesting and the wetlands have a 30 metre riparian management zone.

In the riparian management zone, the guidebook recommends that licensees manage windthrow risk by retaining at least 40 percent of the co-dominant conifers and all deciduous trees concentrated near the wetlands. It also recommends retaining wildlife trees and most non-merchantable conifer trees, understory deciduous trees, shrubs and herbaceous vegetation within 20 metres of wetlands. The licensee's FDP specified that harvesting in the riparian management zone would leave a minimum of 40 percent of the co-dominant conifers and all of the deciduous trees. As well, the licensee would retain all wildlife trees, understory vegetation, non-merchantable trees and shrubs in the riparian management zone.

In this case, the licensee's FDP complied with the Code requirements for riparian management areas, as the FDP left a 30 metre riparian management zone around the wetlands and the management zone practices were consistent with the *Riparian Management Area Guidebook* recommendations.

Community Watershed Guidebook

Granite Ridge has not been designated as a community watershed under the Code, so the *Community Watershed Guidebook* does not apply to the FDP for the area. The guidebook

primarily provides a methodology for assessing watersheds and their vulnerability to forest development. Although not required, in the Board's view it is good practice for a licensee to consider this guidebook when planning forest developments in an area with notable water concerns.

Section 15 of the *Community Watershed Guidebook* discusses 'spring source areas'. Source areas are the known areas of land that contribute water to springs. The water moves to the springs both through the soil and by surface runoff. The source area consists of a recharge area and a discharge area. Water is collected, stored and moved from the recharge area to a discharge area, such as a spring. The guidebook notes that source areas are difficult to identify, so resource use, such as harvesting, can have unintended effects on the ground water. The guidebook discusses forestry practices guidelines to reduce the potential for water impacts on springs.

For example, the guidebook recommends that there be no roads or forest harvesting within 100 meters upslope of a water intake; that the rate of cut in the catchment area be less than 20 percent at any time; that ditches, roads and trails maintain surface and subsurface water flow; and that rock blasting be avoided.

The licensee did not propose development within 100 metres of a water intake, as recommended in the guidebook. There are five licensed water intakes located below proposed harvesting and road construction. The closest intakes are approximately 250 metres from any development.

The guidebook recommends that the rate of cut (equivalent clearcut areas) in the catchment area should be less than 20 percent at any time. The guidebook notes that for selection cutting, there is no limit on partial harvest cutblock size provided that at least 40 percent of the original basal area is retained. In this case, the majority of the proposed harvesting was not clearcut harvesting but partial-cut harvesting. In addition, the area was assessed by the MOF hydrologist who concluded that the proposed forest operations posed a low risk to water quality and a low to medium risk to water quantity. The hydrologist's report recommended measures to reduce risk to water resources.

The guidebook recommends that ditches, roads and trails should maintain the surface and subsurface water flow. In this case the MOF hydrologist recommended that culverts be used wherever water was expected to collect. He also recommended that the minimum standards for culverts be exceeded and that the culverts be removed after harvesting wherever there were distinct water channels.

The guidebook recognises the sensitivity of subsurface water to blasting and recommends against it. The MOF hydrologist report similarly recommended that there be no blasting. The proposed FDP adopts the MOF hydrologist's assessment of the area and his recommendations for harvesting and road construction. Those recommendations were

consistent with the guidebook recommendations for spring source areas in a community watershed. The MOF hydrologist assessed the area and gave a professional opinion regarding risk, recommending caution but allowing harvest and road building. By contrast, the complainant's report estimated a higher risk to the water supply and recommended no harvesting or road construction.

The Board concludes that while there was no requirement that the *Community Watershed Guidebook* be followed, the FDP committed the licensee to practices adopting the recommended by the MOF forest hydrologist. Those practices, in turn, are consistent with the *Community Watershed Guidebook* recommendations for springs and the Riparian Management Area Guidebook recommendations for wetlands. For these reasons, the Board concludes that the decision to approve the FDP was consistent with sound forest practices, and that it was reasonable for the district manager to conclude that the water resources would be managed and conserved by the FDP.

Conclusions

Did the FDP Meet the Code Requirements for Community Watersheds and Follow the Requirements of the Community Watershed Guidebook?

The Board concludes that the FDP was not required to meet the Code requirements for community watersheds, as Granite Ridge is not a 'community watershed' as defined by the Code. The licensee was not required to conduct a watershed assessment, modify its FDP to be consistent with any pre-existing known watershed assessment, nor was the licensee required to follow the *Community Watershed Guidebook*.

Did the District Manager Adequately Consider Domestic Water Issues in his Approval of the FDP?

The Board concludes that the district manager did consider water resource values in his decision to approve the FDP. The district manager considered the risks to water resources and the mitigation of those risks. It was reasonable for the district manager to expect that the plan would adequately manage and conserve water resources as the FDP adopted all of the recommendations of the MOF forest hydrologist. The FDP was consistent with the *Community Watershed Guidebook* recommendations for springs and the *Riparian Management Area Guidebook* recommendations for wetlands.

Commentary

The interests of the Granite Ridge Water Users came to the attention of the licensee and MOF through the Code's public review and comment provisions for FDPs. In response,

MOF appointed a forest hydrologist to assess the woodlot. MOF and the licensee also met with the water users on site and discussed the issues. Consequently, the final approved FDP included additional measures to mitigate damage, or risk of damage, to the water resource. While the complainant did not consider that the risks were justified, the changes to the FDP were beneficial. Subsequent to the approval of the FDP, the parties have also met and discussed the detailed site plans for the cutblocks. This, too, has resulted in changes to the original licensee plans. While challenging at times, the parties are working together and this is valuable to everyone in understanding the resource values and each other's interests. The Board encourages the complainant, the licensee and the ministry to continue with their efforts towards understanding all parties' interests and issues related to forest development in this area.

The licensee committed to follow the recommendations of the MOF hydrologist in its FDP, and the district manager's approval was premised on the licensee living up to that commitment. Consequently, the Board expects the licensee to will ensure the recommendations are implemented in its site plans, harvesting and road building. Finally, the Board believes it is absolutely essential for MOF to closely monitor the harvesting and road building operations and strictly enforce the licensee's commitment to follow all of the hydrologist's recommendations.